

# FLUOR

FH-0202988

Ms. J. H. Kessner, Program Manager  
Analytical Services  
Bechtel Hanford  
3350 George Washington Way H0-25  
Richland, Washington 99352

Dear Ms. Kessner:

FINAL RESULTS FOR THE 233S LIQUID SAMPLES FROM PROCESS PIPES – SDG  
S0035 AND S0036

References: (1) HNF-SD-CD-QAPP-016, Rev. 6, "222-S Laboratory Quality Assurance Plan," dated April 1, 2002.  
(2) Letter, W. H. Price, BHI, to S. C. Hopperstad, FH, "Letter of Instruction for Analysis of Bechtel Hanford, Inc. Samples at the Fluor Hanford 222-S Laboratory – FY-2002", 095774, dated January 16, 2002.

This letter and attachments present the final results for liquid samples from process pipes received at the 222-S Laboratory from the 233S Plutonium Concentration Facility Process areas on May 14 and 16, 2002. The samples were analyzed for gross alpha/beta and GEA, as indicated in the special instructions on the attached copy of the chain of custody and Request for Sample Analysis forms, in accordance with the Letter of Instruction for Analysis of Bechtel Hanford, Inc. Samples at the Fluor Hanford 222-S Laboratory – FY-2002 referenced above.

If you have any questions regarding this report, please feel free to call me at 373-4314.

Sincerely,



Ruth A Bushaw, Project Coordinator  
Analytical Project Management  
Production Control

RAB:lds

Attachments (5)

**RECEIVED**  
AUG 19 2002

**EDMC**

S0035  
S0036

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Author  
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H0-25

Correspondence No.  
FH-0202988

FINAL RESULTS FOR THE 233S LIQUID SAMPLES FROM PROCESS PIPES—  
Subject: SDG S0035 AND S0036

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ATTACHMENT I

**NARRATIVE**

Consisting of 3 pages,  
Including cover page

## **FINAL RESULTS FOR THE 233S LIQUID SAMPLES FROM PROCESS PIPES – SDG S0035 and S0036**

Two liquid samples from process pipes (B14MB5, SDG S0035 and B14MK9, SDG S0036) from the 233S Plutonium Concentration Facility were received at the 222-S Laboratory on May 14 and 16, 2002. The samples were analyzed for gross alpha/beta and GEA, as indicated in the special instructions on the attached copy of the chain of custody (COC) and Request for Sample Analysis (RSA) forms, in accordance with the *Letter of Instruction for Analysis of Bechtel Hanford, Inc. Samples at the Fluor Hanford 222-S Laboratory – FY 2002 (LOI)*, referenced in the cover letter.

A Data Summary Report is included as Attachment 2. The correlation between the customer sample identification number and laboratory identification numbers is presented in the sample breakdown diagram included as Attachment 3. Copies of the chain of custody and Request for Sample Analysis forms are included as Attachment 4.

The chain of custody form listed specific analytes to report by gamma energy analysis (GEA). Additional analytes were observed with activities above the detection limit. These are provided in a Labcore Extraneous Peak Report presented in Attachment 5.

The chain of custody form for sample B14MB5 listed additional analyses besides those mentioned above. However, instructions on the RSA were for the Laboratory to perform only the GEA and gross alpha/beta analyses and additional analyses may be requested. No additional analyses were requested.

### **Sample Appearance and Handling**

B14MB5 (S02M000083) – This sample consisted of approximately 30 mL of clear liquid with a slight gray tint. No solids were observed.

B14MK9 (S02M000084) – This sample consisted of approximately 30 mL of slightly cloudy, rust/brown colored liquid. No solids were observed.

## **Analytical Results**

### **Quality Control Results**

#### **Laboratory Control Standards**

All laboratory control standard (LCS) recoveries were acceptable in accordance with the 222-S Laboratory Quality Assurance Plan (QAPP-016), referenced in the cover letter.

#### **Method Blanks**

A low level of cesium-137 ( $^{137}\text{Cs}$ ) contamination was detected in the method blank analyzed with sample B14MB5 (S02M000083). Since the sample results were reported as less than the detection limit, the contamination was believed to be associated only with the blank and no reanalysis was requested.

#### **Practical Quantitation Limits (PQL)**

The Laboratory was able to meet all of the requested PQLs, except for gross (total) beta for sample B14MB5. However, since beta was detected in the sample at more than 1000 times the reported detection limit, no reanalysis was requested.

### **Analytical Procedures**

Table 1 presents the 222-S Laboratory analytical procedures used to generate the reported results.

**Table 1. Analytical Procedures**

<b>Analysis</b>	<b>Preparation Procedure</b>	<b>Analysis Procedure</b>
<b>Radionuclide Analyses</b>		
AT/TB	Direct	LA-508-101 Rev. H-0
GEA	Direct	LA-548-121 Rev. F-3

#### **Abbreviations**

AT/TB – total alpha/total beta

GEA – gamma energy analysis

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ATTACHMENT 2

**DATA SUMMARY REPORT**

Consisting of 3 pages,  
Including cover page

Attachment 2. Data Summary Report  
233S SDG13

CUSTOMER SDG #: S0035  
CUSTOMER SAMPLE ID: B14MB5

SAMPLE PORTION: Parent

Sample#	R	A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count	Err%
S02M000083			Cobalt-60 by GEA	uCi/mL	110	<2.46e-05	<8.79e-05	n/a	n/a	n/a	n/a	8.8e-05		n/a
S02M000083			Cesium-137 by GEA	uCi/mL	109	6.36e-05	<1.13e-04	n/a	n/a	n/a	n/a	1.1e-04		n/a
S02M000083			Europium-152 by GEA	uCi/mL	n/a	<5.77e-05	<3.01e-04	n/a	n/a	n/a	n/a	3.0e-04		n/a
S02M000083			Europium-154 by GEA	uCi/mL	n/a	<8.56e-05	<2.70e-04	n/a	n/a	n/a	n/a	2.7e-04		n/a
S02M000083			Europium-155 by GEA	uCi/mL	n/a	<4.42e-05	<7.39e-04	n/a	n/a	n/a	n/a	7.4e-04		n/a
S02M000083			Radium-226 by GEA	uCi/mL	n/a	<5.60e-04	<2.44e-03	n/a	n/a	n/a	n/a	2.4e-03		n/a
S02M000083			Americium-241 by GEA	uCi/mL	n/a	<3.95e-05	7.60	n/a	n/a	n/a	n/a	n/a		0.090
S02M000083			Alpha in Liquid Samples	uCi/mL	100	<7.20e-04	22.5	n/a	n/a	n/a	n/a	1.1e-03		0.46
S02M000083			Beta in Liquid Samples	uCi/mL	107	<2.66e-03	2.42	n/a	n/a	n/a	n/a	4.8e-03		1.1

Attachment 2. Data Summary Report  
 233S SDG13

CUSTOMER SDG #: S0036  
 CUSTOMER SAMPLE ID: B14MK9

SAMPLE PORTION: Parent

Sample#	R	A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S02M000084			Cobalt-60 by GEA	uCi/mL	101	<2.14e-05	<2.22e-05	n/a	n/a	n/a	n/a	2.2e-05	n/a
S02M000084			Cesium-137 by GEA	uCi/mL	99.4	<4.29e-05	6.89e-05	n/a	n/a	n/a	n/a	n/a	47
S02M000084			Europium-152 by GEA	uCi/mL	n/a	<3.87e-05	<9.15e-05	n/a	n/a	n/a	n/a	9.2e-05	n/a
S02M000084			Europium-154 by GEA	uCi/mL	n/a	<5.24e-05	<5.02e-05	n/a	n/a	n/a	n/a	5.0e-05	n/a
S02M000084			Europium-155 by GEA	uCi/mL	n/a	<4.68e-05	<2.24e-04	n/a	n/a	n/a	n/a	2.2e-04	n/a
S02M000084			Radium-226 by GEA	uCi/mL	n/a	<3.03e-04	<4.72e-04	n/a	n/a	n/a	n/a	4.7e-04	n/a
S02M000084			Americium-241 by GEA	uCi/mL	n/a	<1.12e-04	6.20	n/a	n/a	n/a	n/a	n/a	0.13
S02M000084			Alpha in Liquid Samples	uCi/mL	96.1	<4.98e-04	21.8	n/a	n/a	n/a	n/a	6.0e-04	0.32
S02M000084			Beta in Liquid Samples	uCi/mL	105	<1.13e-03	1.64	n/a	n/a	n/a	n/a	2.4e-03	0.95



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ATTACHMENT 3

**SAMPLE BREAKDOWN DIAGRAM**

Consisting of 3 pages,  
Including cover page

# 233-S Pu Concentration Facility Samples

SDG S0035

Liquid from Process Pipe

B14MB5



S02M000083

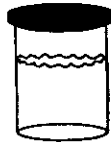
Total Alpha/Beta  
GEA:  $^{137}\text{Cs}$ ,  $^{60}\text{Co}$ ,  
 $^{152}\text{Eu}$ ,  $^{154}\text{Eu}$ ,  
 $^{152}\text{Eu}$ ,  $^{226}\text{Ra}$ ,  
 $^{241}\text{Am}$

# 233-S Pu Concentration Facility Samples

SDG S0036

Liquid from Process Pipe

B14MK9



S02M000084

Total Alpha/Beta  
GEA: <sup>137</sup>Cs, <sup>60</sup>Co,  
<sup>138</sup>Ba, <sup>139</sup>La,  
<sup>152</sup>Eu, <sup>226</sup>Ra,  
<sup>241</sup>Am

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ATTACHMENT 4

**CHAIN OF CUSTODY AND  
REQUEST FOR SAMPLE ANALYSIS FORMS**

Consisting of 5 pages,  
Including cover page

<b>Bechtel Hanford Inc.</b>		<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>				<b>B99-025-09</b>		Page 1 of 1									
Collector <b>D. B ENCKE</b>		Company Contact Dave Encke		Telephone No. 373-3461		Project Coordinator TRENT, SJ		Price Code <b>9L</b> Data Turnaround <b>60 Days</b>									
Project Designation 233-S Plutonium Concentration Facility Process Areas - Other		Sampling Location <b>233-S</b>		SAF No. B99-025		Air Quality <input type="checkbox"/>											
Ice Chest No. NA		Field Logbook No.		COA R233SP2800		Method of Shipment Hand Carry											
Shipped To 222-S Lab Operations		Offsite Property No. NA		Bill of Lading/Air Bill No. NA													
<b>POSSIBLE SAMPLE HAZARDS/REMARKS</b>  <b>RADIOACTIVE</b>  Special Handling and/or Storage				Preservation	None												
				Type of Container	aG												
				No. of Container(s)	1												
				Volume	60mL												
<b>SAMPLE ANALYSIS</b>  <b>S02M000083</b>				See item (1) in Special Instructions.													
Sample No.	Matrix *	Sample Date	Sample Time														
B14MB5	OTHER LIQUID	5-10-02	10:30	X													
<b>CHAIN OF POSSESSION</b>				<b>Sign/Print Names</b>				<b>SPECIAL INSTRUCTIONS</b> Results from Gross/Alpha Beta GEA is due within 7 days. Depending upon results additional analysis may be requested. 222-S COA: DB2010  (1) Gross Alpha; Gross Beta; Gamma Spectroscopy (Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Radium-226); Americium-241/Curium-244; Neptunium-237; Isotopic Plutonium; Strontium-90; Total Uranium				<b>Matrix *</b> S=Soil SE=Sediment SO=Solid SI=Sludge W=Water O=Oil A=Air DS=Dryn Solids DL=Dryn Liquid T=Tissue WI=Wipe L=Liquid V=Vegetation X=Other					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time											
D B Encke / D B Encke		5/14/02		S J GALE / M J L		5/14/02 1000											
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time											
S J GALE / M J L		5/14/02 10:10		R I STEELE / R I STEELE		5/14/02 1000											
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time											
FLUOR				E R C		5/15/02											
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time											
FLUOR				E R C		5/30/02 1100											
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time											
R I STEELE / R I STEELE		5/20/02 1100		S J GALE / M J L		5/30/02 1100											
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time											
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time											
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time											
<b>LABORATORY SECTION</b>		Received By		Title				Date/Time									
<b>FINAL SAMPLE DISPOSITION</b>		Disposal Method		Disposed By				Date/Time									

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-025-010		Page 1 of 1													
Collector <b>A RODRIGUEZ</b>		Company Contact Dave Encke		Telephone No. 373-3461		Project Coordinator TRENT, SJ		Price Code <b>9L</b>													
Project Designation 233-S Plutonium Concentration Facility Process Areas - Other		Sampling Location <b>233-S</b>		SAF No. B99-025		Air Quality <input type="checkbox"/>		Data Turnaround <b>60 Days</b>													
Ice Chest No. NA		Field Logbook No.		COA R233SP2800		Method of Shipment Hand Carry															
Shipped To 222-S Lab Operations		Offsite Property No. NA		Bill of Lading/Air Bill No. NA																	
POSSIBLE SAMPLE HAZARDS/REMARKS																					
Special Handling and/or Storage				Preservation	None																
				Type of Container	aG																
				No. of Container(s)	1																
				Volume	60mL																
SAMPLE ANALYSIS				See item (1) in Special Instructions.																	
<b>S02M000084</b>																					
Sample No.	Matrix *	Sample Date	Sample Time																		
B14MK9	OTHER LIQUID	5-14-02	1830	X																	
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS						Matrix *							
Relinquished By/Removed From <b>A. Rodriguez</b> Date/Time <b>5.16.02 1000</b>				Received By/Stored In <b>SJGALE</b> Date/Time <b>5/16/02 1000</b>				Results from Gross/Alpha Beta GEA is due within 7 days. Depending upon results additional analysis may be requested. 222-S COA: DB2010  (1) Gross Alpha; Gross Beta; Gamma Spectroscopy (Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Radium-226)						S=Soil SE=Scumment SO=Solid SL=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue WI=Wipe L=Liquid V=Vegetation X=Other							
Relinquished By/Removed From <b>SJGALE</b> Date/Time <b>5/16/02 1030</b>				Received By/Stored In <b>FLUOR</b> Date/Time <b>5/16/02 1030</b>																	
Relinquished By/Removed From <b>FLUOR</b> Date/Time				Received By/Stored In <b>ERC</b> Date/Time <b>5/30/02 1100</b>																	
Relinquished By/Removed From <b>FLUOR</b> Date/Time				Received By/Stored In <b>ERC</b> Date/Time <b>5/30/02 1100</b>																	
Relinquished By/Removed From				Received By/Stored In																	
Relinquished By/Removed From				Received By/Stored In																	
LABORATORY SECTION		Received By		Title		Date/Time															
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time															

Group ID No. (For lab use only)

A-6002-365 (01/9





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ATTACHMENT 5

**LABCORE EXTRANEIOUS PEAK REPORT**

Consisting of 2 pages  
Including cover page

# LABCORE Extraneous Peak Report

Bechtel

Report w12ea/rev. 2 p 1

28-jun-2002 07:53:37

Seq#	Type	Sample #	Client ID	Extraneous Peak Name	Matrix	Result	MDL	Units	RQ
Sample Group#: 20020184									
		S02M000083	233S SDG13 (B14MB5) Parent	NP-237	LIQUID	4.614e-2	0.000	uCi/mL	
		S02M000083	233S SDG13 (B14MB5) Parent	NP-237 Count Error	LIQUID	3.300	0.000	%	
		S02M000083	233S SDG13 (B14MB5) Parent	PA-233	LIQUID	2.681e-2	0.000	uCi/mL	
		S02M000083	233S SDG13 (B14MB5) Parent	PA-233 Count Error	LIQUID	5.270	0.000	%	
		S02M000083	233S SDG13 (B14MB5) Parent	PU-239	LIQUID	9.598	0.000	uCi/mL	
		S02M000083	233S SDG13 (B14MB5) Parent	PU-239 Count Error	LIQUID	13.590	0.000	%	
Sample Group#: 20020188									
		S02M000084	233S SDG13 (B14MK9) Parent	NP-237	LIQUID	1.134e-3	0.000	uCi/mL	
		S02M000084	233S SDG13 (B14MK9) Parent	NP-237 Count Error	LIQUID	40.960	0.000	%	
		S02M000084	233S SDG13 (B14MK9) Parent	PA-233	LIQUID	7.038e-4	0.000	uCi/mL	
		S02M000084	233S SDG13 (B14MK9) Parent	PA-233 Count Error	LIQUID	28.840	0.000	%	
		S02M000084	233S SDG13 (B14MK9) Parent	PU-239	LIQUID	13.28	0.000	uCi/mL	
		S02M000084	233S SDG13 (B14MK9) Parent	PU-239 Count Error	LIQUID	3.280	0.000	%	
		S02M000084	233S SDG13 (B14MK9) Parent	U-237	LIQUID	1.607e-3	0.000	uCi/mL	
		S02M000084	233S SDG13 (B14MK9) Parent	U-237 Count Error	LIQUID	13.490	0.000	%	

RQ=Result Qualifier  
MDL=Minimum Detection Limit

B=Analyte Found In Assc. Blank  
ND=Analyte was Not Detected

J=Estimated Value  
Z=See Comments

U=Analyzed For But Not Detected  
N=Identification Based on MS Lib